

# GEOMETRICIAN'S VIEWS

## TOPIC: PENDULUM

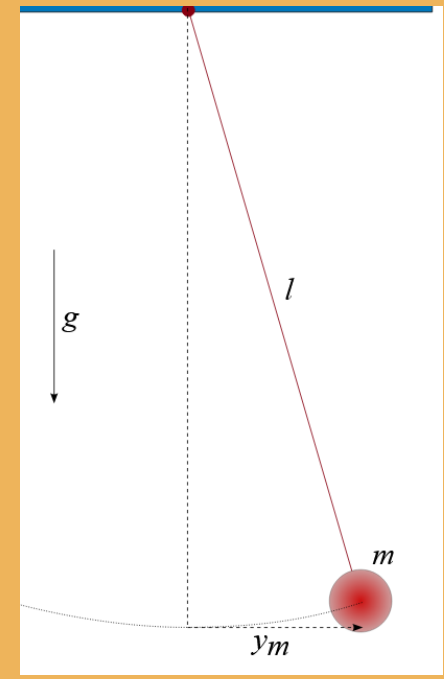


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### Mathematical View

The **gravitational pendulum** represents a physical system, consisting of a body of mass  $m$  suspended from a fixed point by a wire of length  $l$ , which performs an oscillatory movement under the action of the gravitational force. It was first studied in depth by the Italian scientist Galileo Galilei and applied to the study of the movement of bodies. *The period of an oscillation performed by a gravitational pendulum remains constant, regardless of the mass of the body hanging from the string, when the oscillations are small.* In the case of low-amplitude oscillations, the period of a complete oscillation performed by the gravitational pendulum is given by formula (1) where  $T$  is the period (measured in seconds),  $l$  is the length of the wire (expressed in meters), and  $g$  is the gravitational acceleration



#### Foucault's pendulum

Foucault's pendulum is an experimental device based on the gravitational pendulum, made by the French physicist Léon Foucault, which proves that the Earth rotates on its axis.

Researcher, Ioan Fechet

„The realization of this pendulum is an important moment in the history of universal physics, because it is an instrument that proves that the earth rotates. In building B of the University of Oradea there was that generous space and I thought that it could be used to install such a pendulum there. Of course, every generation of students also had a lesson in applied physics, held on site," says university professor Coriolan Rus, who has reached the venerable age of 92.



### Artistic View

For over five centuries, physicists have been carefully studying the "pendulum phenomenon". Why do we say phenomenon? In the past, the present-day pendulum was represented by hazelnut sticks used to search for underground water.

The artist proposes a practical application: Obtaining an artistic composition using paint and a pendulum. The composition is made by balancing two separate cups having different colours of paint.

The source of inspiration is at:

<https://www.youtube.com/watch?v=2LgEz2-RCBE>

From an artistic point of view the movement of the pendulum describes arcs of a circle, similar to a family of ellipses.

The artist's opinion: Barbu Niculina  
and Alexandra-Doria Jurj

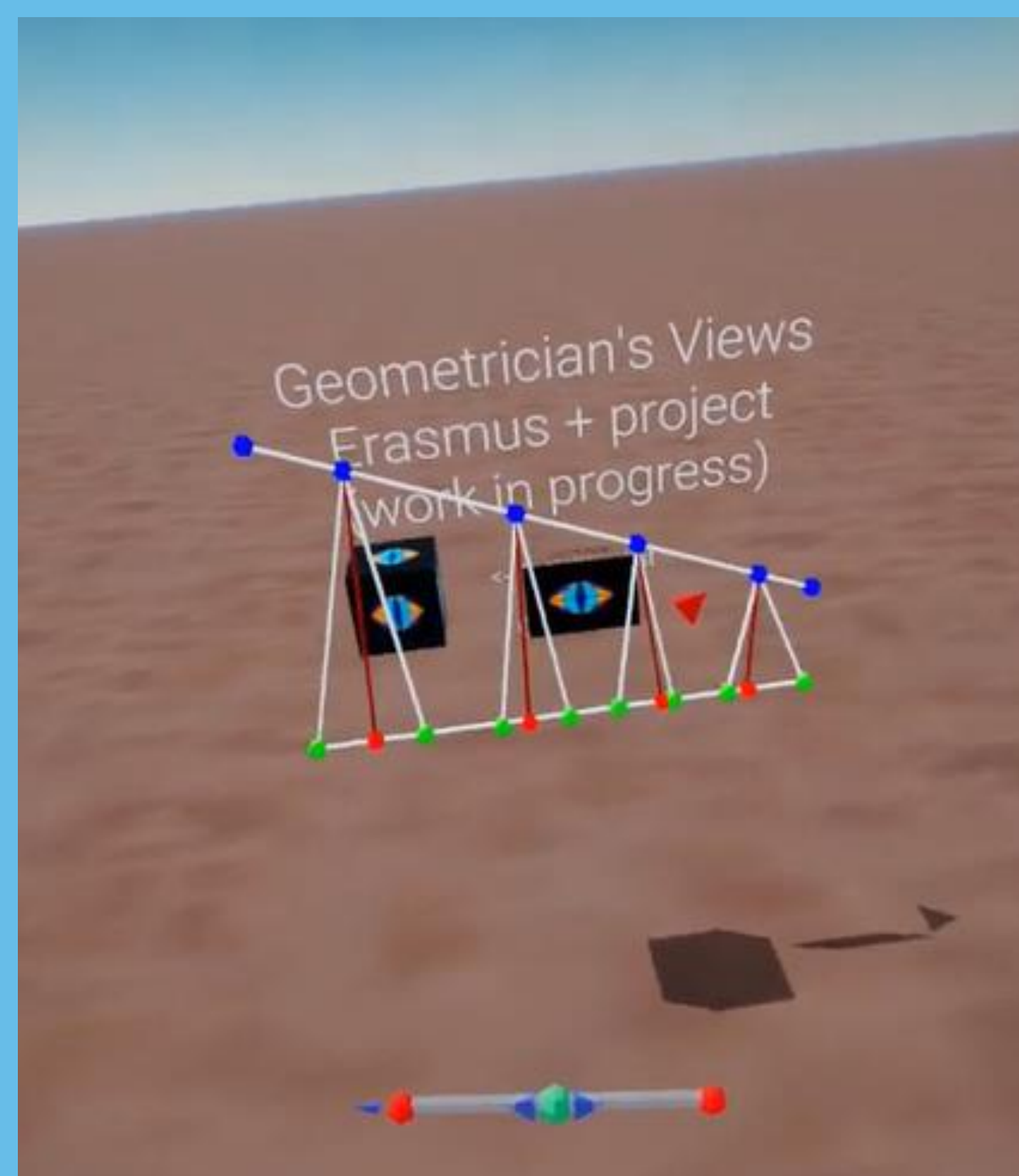


### Common View

With NeoTrie VR software, a simulation of the gravitational pendulum will be carried out, so that it can be observed that as the length of the pendulum increases, its period decreases. [https://youtu.be/JP9\\_OGXuXOA](https://youtu.be/JP9_OGXuXOA)

#### MATHEMATICAL AND ARTISTIC SKILLS

- students will experimentally verify the period of a gravitational pendulum;
- students will have the opportunity to photograph or film a pendulum clock and understand its working principle.



artists, researcher, teachers involved in the project

